

TECHNICAL SHEET

Introduction to maize

The scientific name *Zea mays* L. is a tropical annual herbaceous plant of the Poaceae family. The maize plant is a cereal whose grains are rich in starch. The maize kernel is made up of three parts: the embryo, commonly known as the germ, the albumen, which is essentially made up of starch grains, and the outer shell, which is a thin membrane. The size and weight of the grain depends on the variety. 1000 maize kernels weigh between 200 and 350 grams and can be up to 700 grams depending on the variety. There are several varieties of maize grown for human consumption: sweet maize, pearl maize, dent maize, floury maize and glass maize, which is also used as fodder.

Maize cycle

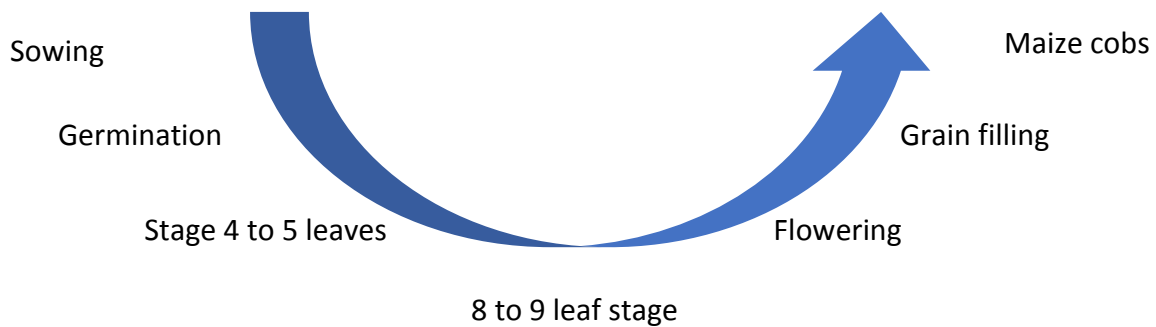


Figure 1: Maize cycle

After sowing, the plant develops over a period of 5 to 7 months. This development takes place in three main phases:

- **The vegetative phase:** this corresponds to the formation of the roots, the stem and the leaves.
- **Reproduction:** during this phase, the reproductive organs (male and female) appear. First, the male panicle containing the stamens (pollen) appears. The female flowers will appear a few days later and give rise to the spikes.
- **Grain development and ripening:** At this stage, the grain filled with water and products of photosynthesis forms and reaches maturity. When the plant turns yellow and dries out, the ears can be harvested.

Growing maize in Ghana

Many households in Ghana produce and consume maize. In the north of the country, it is not only a staple crop, but also a cash crop. It accounts for 62% of the country's total cereal production (rice 16%, sorghum 14% and millet 8%). Maize is a staple food for Ghanaians and is an increasingly important component of poultry feed.

Maize production in northern Ghana is threatened by declining soil fertility (mainly low nitrogen content), increasing incidence of drought and infestation by *Striga hermonthica* (*Striga*). The combined effects of these stresses can lead to a reduction in yields of up to 80%, with negative effects on the food security and livelihoods of affected households. In order to increase maize productivity at the smallholder level, maize varieties to be grown in savannah areas should have desirable levels of tolerance to the above-mentioned stresses.

CSIR-Denbea was extensively tested for adaptation to drought and *Striga* across drought prone and *Striga* endemic areas of northern Ghana. It was also tested for superior agronomic performance and yield potential across major agro-ecological zones of the country. The grain yield of CSIR-Denbea on researchers' and farmers' fields were 6.5 t/ha and 3.7 t/ha, respectively. The results of participatory variety selection trials conducted in 2014 to 2016 revealed high farmer preference of CSIR-Denbea for cultivation and high consumer acceptability for local dishes.

Targets of the technology

- Small, medium and large seed companies
- Agricultural input dealers
- Processors
- Livestock feed industry
- Breweries

Area of application of the technology

- This variety can be grown successfully in all agro-ecologies of Ghana, but it performs best in the savannah and forest-savannah transition zones of Ghana.
- It can also be successfully produced in the Guinean and Sudanese savannah zones of other West African countries such as Nigeria and the Republic of Benin.

Level of technology development or deployment

Fully developed technology being commercialized

Photo of the technology



Figure 2: CSIR-DENBEA, a climate-smart hybrid maize variety

References

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